NASA Procedural Requirements

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Subject: Energy Efficiency and Water Conservation w/Change 1 (3/30/04)

Responsible Office: Environmental Management Division

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CHAPTER 3. Energy Efficiency and Conservation Management Program

3.1 The Energy Efficiency and Conservation Management Program

3.1.1 Energy efficiency and conservation management ensure that energy and water are used effectively and judiciously. A successful program not only involves energy conservation and engineering, but every area of institutional management, including facilities and maintenance management, procurement, administration, and communications and public affairs.

3.1.2 There are many ways to increase energy efficiency, although nearly all measures can be classified into the following basic categories that make up the foundation of the energy management program:

a. Low- and no-cost O&M measures to ensure peak performance from new existing energy-consuming systems.

b. Retrofit to provide technological improvements to existing buildings and equipment.

c. Replacement of worn out equipment with high-efficiency equipment (although inefficient equipment should be replaced prior to its scheduled replacement time if economically beneficial).

d. Installation of energy-efficient equipment, systems, and components in new construction and major rehabilitation and modification projects.

e. Load shifting and peak shaving to reduce utility demand charges.

3.1.3 To be successful, an energy efficiency and conservation management program must be carefully planned, following a logical sequence of steps, as follows:

a. Obtain top management support for an effective energy conservation program.

b. Organize the Energy Efficiency Team (EET).

c. Gather background information by evaluating energy purchases, establishing an Energy Use Index (EUI), and assembling other data to identify energy consumption patterns and potential areas for energy conservation opportunities.

d. Conduct an energy audit to identify and prioritize energy conservation opportunities. Conducted either by qualified in-house engineers or by contractors, this can be a walk-through or comprehensive audit. The energy audit is addressed in depth in chapter 4.

e. Develop the Center Energy-Efficiency and Water Conservation 5-Year Plan by establishing priorities and formulating schedules, budgets, and goals. The Plan should be a formal written document, outlining the Center's energy policy and objectives, strategies, programs, and action items making up the strategic plan to realize the energy policy's goals. Recommended elements of the Plan are detailed in paragraph 3.2.

f. Implement, promote, and monitor the plan. This includes energy project budgeting and programming, energy management program reporting, and energy awareness program development.

3.2 Center Energy-Efficiency and Water Conservation 5-Year Plan

3.2.1 Requirement. EO 13123, Section 302, requires NASA to prepare an annual implementation plan for fulfilling the requirements of the Order. The Agency implementation plan is based on individual plans developed by each Center and Component Facility. Each Center and Component Facility is required to develop and maintain an individual Energy-Efficiency and Water Conservation 5-Year Plan tailored to the needs, resources, and opportunities at each location.

3.2.2 Preparation and Submission. Each Center shall maintain an Energy Efficiency and Water Conservation 5-Year Plan approved by the Center Director. Component Facility plans may be included as part of the Center plan, or if approved by the Center Director, prepared separately. Approved Center Plans must be submitted to the Associate Administrator for Management Systems, with a copy to the cognizant Enterprise Institutional Program Officer within one year of the date of this directive. Center plans shall be reviewed and updated as needed, but not less than every three years. The Director, Environmental Management Division,

Headquarters Code JE, shall review Center plans to ensure that they are current during Energy and Water Management Functional Reviews.

3.2.3 Content. Center plans shall focus on goals, implementation strategy, and resource requirements. The plans are intended to elicit and sustain management support. Center plans shall include the following elements:

a. Mission/Value Statement - A simple statement of why the plan is important and what it will accomplish in 5 years.

b. Authorities - Identify applicable Federal statutes, Executive Orders, Agency and Center directives related to energy and water management such as:

c. Goals - Describe the long-term goals of the plan, what is required to meet them, and the expected outcomes if the goals are met.

(1) The following long-term goals shall be included in the plan as applicable to the Center:

(i) Reduce energy use per gross square foot in Nonmission Variable Buildings 20 percent by FY 2000, 30 percent by FY 2005, and 35 percent by FY 2010, relative to FY 1985 baseline.

(ii) Improve energy efficiency of Energy-Intensive Buildings 20 percent by FY 2005 and 25 percent by FY 2010, relative to FY 1990 baseline.

(iii) Improve energy efficiency of Mission Variable Facilities 10 percent by FY 2005, relative to FY 1985 baseline.

(iv) Reduce greenhouse gas emissions attributed to facility energy use 30 percent by FY 2010, relative to FY 1990 baseline.

(v) Expand renewable energy use.

(vi) Reduce petroleum use.

(vii) Reduce water use by implementing appropriate best management practices.

(viii) Reduce utility costs.

(2) Current progress - Review current Center progress toward these goals.

(3) Required actions - Identify additional actions needed to meet the long-term goals.

(4) Expected outcomes - Identify the tangible and intangible benefits of taking these actions including all associated savings and cost avoidances.

d. Organization - Describe the Center organization for energy efficiency and conservation management, including authorities and responsibilities.

(1) Lead and supporting organizations.

(2) The EET.

(3) Ad hoc "Tiger" teams.

e. Audits - Identify facility audits completed since 1991. Identify required facility audits to be performed over the next 5 years and how will they be accomplished.

f. Projects - Identify significant energy efficiency, renewable energy, and water conservation projects that will be implemented over the next 5 years and how will they be funded.

(1) Construction of Facilities (CoF) funded.

(2) Center funded.

(3) Alternative financing.

(i) ESPC.

(ii) UESC.

g. Resources - Identify resources needed to implement the plan.

(1) Funding.

(2) People.

(3) Training.

h. O&M - Identify O&M procedures or process improvements that will be implemented or sustained over the next 5 years to help manage energy and water use.

i. Awareness - Identify energy efficiency and water conservation awareness activities that will be implemented or sustained over the next 5 years.

(1) Communication with employees, contractors, and the general public.

(2) Ongoing outreach programs.

(3) Specific activities and events.

3.3 The Energy Manager

3.3.1 As required by NPD 8500.1, "NASA Environmental Management," a key individual shall be appointed at each Center and Component Facility to serve as the focal point for all energy matters and to manage and monitor energy consumption and conservation. These individuals shall become trained energy managers as required by EPACT.

3.3.2 EPACT requires executive departments and agencies to establish and maintain programs to ensure that facility energy managers are "trained energy managers." This entails demonstrated proficiency or a completed course of study in all of the following areas:

a. Fundamentals of building energy systems.

b. Building energy codes and applicable professional standards.

c. Energy accounting and analysis.

d. Life-cycle cost methodology.

e. Fuel supply and pricing.

f. Instrumentation for energy surveys and audits.

3.3.3 Demonstrated proficiency can be verified by on-the-job performance in current or previous positions or through certification as an energy manager by an appropriate professional organization or public education institution. Alternative courses of study must have been obtained through a private or public education institution, a Government agency program, or a professional association training program.

3.3.4 Responsibilities. The energy manager serves as the local source of expertise on energy conservation and efficiency management policies, procedures, requirements, and processes. In addition to the responsibilities assigned in NPD 8500.1, the energy manager shall perform or manage the specific activities delineated below and summarized in Figure 3-1.

a. Planning and Organization

(1) Prepare and update the Center Energy-Efficiency and Water Conservation 5-Year Plan.

(2) Review and monitor energy-use trends, patterns, and future requirements.

(3) Track progress toward meeting agency energy goals.

(4) Monitor monthly utility bills.

(5) Organize a Center EET.

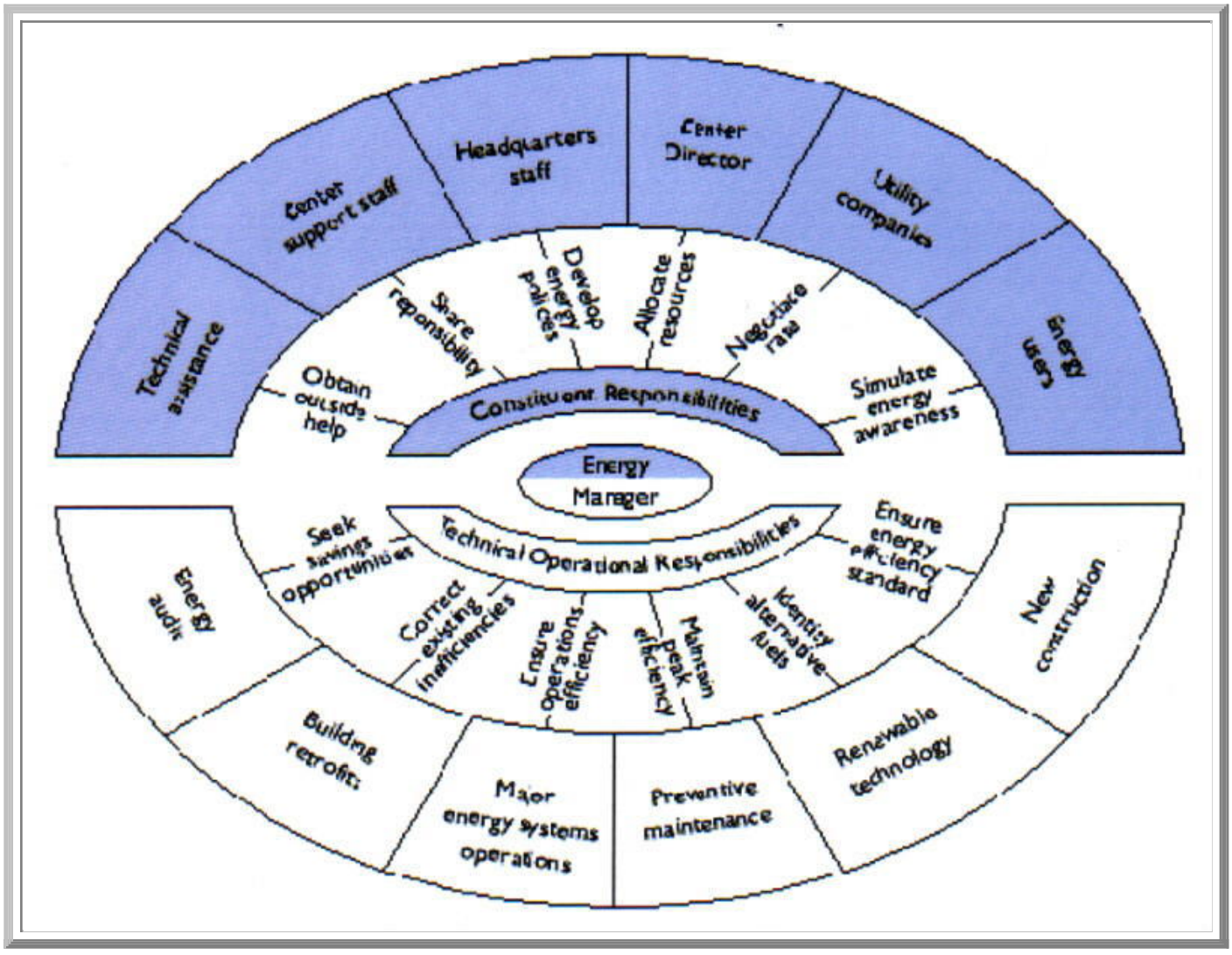

Figure 3-1. Responsibilities of the Energy Manager

b. Budgeting and Project Programming

(1) Assist in preparing the Center energy budget.

(2) Request funds for energy projects.

(3) Keep track of energy project funding status.

c. Program Management

(1) Establish and promote an energy awareness program among Federal and contractor personnel.

(2) Initiate and manage an energy audit program using approved life-cycle cost methods.

(3) Establish and implement certification procedures to ensure that new facilities are designed and constructed to comply with existing Federal energy performance standards.

(4) Monitor CoF and Center-funded energy projects.

(5) Provide technical input to facilities maintenance programs to ensure that energy efficiency is addressed in facilities maintenance programs.

(6) Initiate a facilities metering program.

(7) Participate in demand-side management (DSM) programs.

(8) Investigate ESPC and UESC opportunities and take the lead in implementing such contracts.

(9) Procure energy-efficient supplies and equipment replacements.

(10) Prepare an emergency conservation plan. The requirement for emergency conservation plans is contained in 10 CFR 436, Subpart F, Section 436.105. Appendix D provides a recommended plan of action for emergency electricity reduction at Federal developed by DOE. Center emergency conservation plans shall be customized to site-specific conditions.

d. Administration

(1) Determine and maintain appropriate nonmission variable, energy-intensive, and mission variable facility energy designations.

(2) Report quarterly energy consumption data to Headquarters via NETS.

(3) Report annual energy program accomplishments to Headquarters via NETS.

(4) Establish and communicate Center energy policies.

(5) Coordinate EET activities.

(6) Review and evaluate energy suggestions.

(7) Establish an energy award program.

(8) Participate in utilities contract negotiations.

3.3.5 Although facility construction is beyond the scope of this NPR, energy managers shall participate in design reviews to ensure that designers are meeting the energy design requirements outlined in 10 CFR Part 434 and the sustainable design and construction requirements of EO 13123 and NPD 8820.3.

3.4 The Energy Efficiency Team

3.4.1 After obtaining top management support each Center shall establish an EET. The EET plans and implements all activities of the energy efficiency and conservation management program. Spreading responsibilities among various organizations helps establish program identity and gives those organizations a stake and interest in program decisions.

3.4.2 The selection of the energy manager is the first and most important step in building an EET. The energy manager is responsible for leading and managing all energy efficiency and conservation management program activities carried out by the EET. The energy manager must be a dynamic individual who takes the initiative to develop forward-thinking energy efficiency and conservation management approaches and accomplish action items.

3.4.3 The EET shall be drawn from a wide cross-section of relevant Center organizations, including: Center Operations, Transportation, Chief Financial Officer, Logistics, Procurement, Public Affairs, and the Program and Project organizations (such as Research Directorates). Onsite support contractors responsible for O&M of energy-consuming systems and equipment shall be included on the team as appropriate. The primary qualifications for participation should be willingness and enthusiasm. Team members not only must be dedicated to the concept of energy efficiency and conservation management, but also should be in a position that enables them to implement the program within their own organization.

3.4.4 In addition to involving the various organizations in the energy efficiency and conservation management program through the EET, the energy manager must establish informal lines of communication with key staff members whose assistance is critical in implementing energy efficiency and conservation management projects. These staff members include building managers from each facility, utilities managers, plant supervisors, contracting officers, design engineers, supply officers, project programmers, budget managers, other energy managers, and utilities company representatives.

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